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ABSTRACT

There exist two commonly held views regarding the use of multimedia and Internet technology within learning environments. Many educators believe that the presence of content material on CD-ROM or the Internet will help students reach their learning goals, and students "like" multimedia and/or Internet based delivery. This paper explores these views through analysis of the design and development of an eLearning solution. The paper concludes as follows. The use of a supported eLearning environment for the subject "Issues in the Design and Delivery of Multimedia" provided students with a valuable learning resource. While students enjoyed ease of access, intellectual challenge and willingly contributed to the online fora, the majority of high level discussion and complex reasoning still took place within the on campus classroom. Within distributed learning environments, multimedia and Internet technology provide a vehicle for the transmission of content material, in the same way print materials, and audio/video cassettes have traditionally done. Technical capabilities aside, it matters little whether content is delivered via CD-ROM, the Internet, audio or video cassette, or even print based materials, as these technologies merely provide the substrate to the learning resource. Unless the subject structure and content is based on sound pedagogical theory, and sits within a coherent, supported learning framework, it will make no difference whether cutting edge multimedia and Internet technology have been used. The content will make little sense to the learner. (Contains 11 references and 3 figures.) (Author/AEF)

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Lights and Wires: Effective eLearning

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Abstract: There exist two commonly held views regarding the use of multimedia and Internet technology within learning environments. Many educators believe that the presence of content material on CD-ROM or the Internet will help students reach their learning goals, and students 'like' multimedia and /or Internet based delivery. This paper explores these views through analysis of the design and development of an eLearning solution.

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Introduction

"Television can teach. It can illuminate. Yes, it can even inspire. But it can do so only to the extent that humans are determined to use it to those ends. Otherwise, it is merely lights and wires in a box". Edward R. Murrow

While this statement is obviously discussing the use of television as a learning resource, the same sentiment can be directed toward eLearning solutions. However, the thought of an expensive eLearning solution as merely 'lights and wires in a box' is probably enough to strike fear into the hearts of most eLearning providers. Given the general view that the use of educational multimedia applications and online learning solutions enhance learning effectiveness, such a stance is akin to heresy. Instructional designers developing eLearning solutions claim 'improved learner outcomes' (Colorito, 2001) and 'more effective learning experiences' (Maki et al, 2000). These are nice ideas. Happy learners and even happier teachers skipping down the yellow brick path toward successful learning outcomes. However, not a lot unlike the young woman in the sparkling red shoes, it does not take long to discover that fantasy and reality are somewhat distanced from one another.

There exist two commonly held views regarding the use of multimedia and Internet technology within learning environments. Many educators believe that the presence of content material on CD-ROM or the Internet will help students reach their learning goals, and students 'like' multimedia and /or Internet based delivery. Many factors play a part in shaping an individual's learning experience, not least of all the assumptions of the instructional designer. For example, using Brookfield's paradigmatic assumption, learners within the university context will be predominantly proactive, highly motivated consumers of knowledge. Associated with this assumption is the prescriptive assumption that as the students are proactive, self-directed learners then the best teaching will be that which encourages students to take control over designing, conducting and evaluating their own learning (Brookfield, 1995). Therefore, if the paradigmatic and prescriptive assumptions are correct, it follows that if an environment is created to support self directed learning such learning will (naturally) take place (causal assumption). This is largely the reasoning applied to the integration of multimedia and Internet technology within learning environments. Students 'like' multimedia and/or Internet based content therefore if learning facilitators provide such environments students will (naturally) have successful learning outcomes.

While many learners may prefer, or perhaps expect, to access content material via the Internet recent research does not support the view that students prefer this mode of delivery (McInnis, James & Hanley, 2000). New technology is seductive, this danger is especially apparent when multimedia and Internet technology are viewed as a providing improved learning experiences. However, it is important to not allow technology to overwhelm the foundations of an effective learning experience. Whether delivered via CD-ROM, the Internet, cassette or print, we should seek to provide a learning experience that is meaningful to all users. Jonassen (2001) discusses eight qualities inherent in meaningful learning environments. These are:

- Active: Learners are engaged by the learning process in mindful processing of information where they are responsible for the result.

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- Constructive: Learners integrate new ideas with prior knowledge in order to make sense or make meaning or reconcile a discrepancy, curiosity, or puzzlement.
- Collaborative: Learners naturally work in learning and knowledge building communities, exploiting each others skills while providing social support and modeling and observing the contributions of each member.
- Intentional: All human behavior is goal directed.
- Complex: Unless learners are required to engage in higher order thinking, they will develop oversimplified views of the world.
- Contextual: A great deal of recent research has shown that learning tasks that are situated in some meaningful real world task or simulated in some case-based or problem based learning environment are not only better understood, but also are more consistently transferred to new situations.
- Conversational: Learning is inherently a social, dialogical process. … Technologies can support this conversational process by connecting learners across town or across the world.
- Reflective: Learners should be required by technology-based learning to articulation what they are doing, the decisions they make, the strategies the use, and the answers that they found.

(Jonassen, 2001)

In view of these effective practice guidelines and qualities as articulated Jonassen (2001) the challenge for educators and eLearning providers is to build in to the distributed educational context dynamic, collaborative, and conversational environments. However, integrating collaboration and conversation within a distributed learning environment is easier said than done. The following case study explores the way in which these guidelines informed the development of an eLearning environment for a core subject for second year university computing students.

Case Study - 'Issues in the Design and Delivery of Multimedia' eLearning resource

History: The subject content and Internet site were partially developed in 1999 and both were extensively revised in 2000. The structure, sequence and content of the subject and the Internet site have been used as teaching and learning resources for two years (2000 and 2001).

Subject: 'Issues in the Design and Delivery of Multimedia' focuses on examining and analysing ethical, legal, social and professional issues in the development and delivery of multimedia. In this subject issues such as software piracy, computer crime, online pornography, professional ethics and the impact and implications of the use of technology are critically analysed.

Learners and Mode: Typically the student cohort comprises (generally) motivated adult learners from a variety of experiential and cultural backgrounds. Approximately 15% of learners are international students and between 20% and 40% are aged over 25 years. The subject is delivered in on campus mode. An extensive Internet site was developed to support lectures and workshops.

Methodology: The creation of educational environments, both in class and online, that fostered collaboration, conversation and activity (Jonassen, 2001) underpinned the philosophical orientation of the instructional design process. In many respects, the process of designing and developing online instructional materials closely resembles a software development life cycle model in that the instructional design process is an iterative one. Progression relies on analysis and evaluation of the objectives and outcomes of the preceding phase. The instructional design process used in the development of the eLearning environment relied on four primary phases that guided and shaped the development process. The phases are illustrated in Figure. 1.

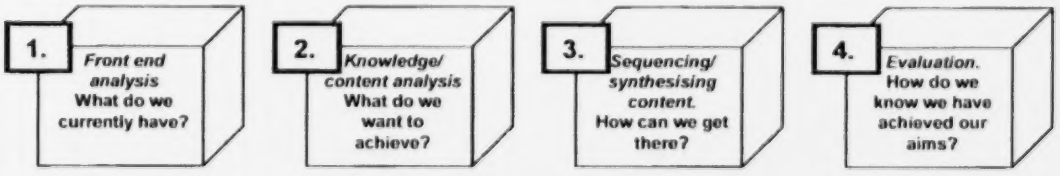

Figure 1. Four stage instructional design process.

Phase 1: Front end analysis. What do we currently have? (What are the global aims and specific objectives? What resources can be utilised to achieve those goals?) In this phase, existing subject content was reviewed to update specific content areas. This phase examined the current teaching and learning process and specifically analysed the assessment instruments in relation to the stated subject aims and objectives. Feedback regarding content and teaching strategy was sought from learners and colleagues. The major focus of the review concentrated on addressing three primary areas identified in the initial problem analysis:

- Explicitly stating global aims and specific objectives and strengthening the relationships between aims, objectives and content.
- Identifying learner entry and exit points (including assessment) and the relationships between them.
- Addressing inconsistencies in delivery media and identifying opportunities for implementation of innovative delivery strategies.

Global aims: The solution sought to incorporate the following global educational aims in order to strengthen the relationship between aim, objective and content. At the completion of the subject learners should:

- have developed an awareness and understanding of the concepts, practices and ethical codes and conventions regarding the design and delivery of multimedia applications and technology generally
- have developed an understanding of the issues and implications regarding management of knowledge
- exhibit high level critical thinking and problem solving skills
- have developed high level verbal and written communication skills and be encouraged to think critically about the uses (and abuses) of multimedia and information technology generally
- exhibit responsible and discerning use of technology in general

Specific objectives: Further to strengthening the relationships between aim, objective and content in relation to global educational aims, the following areas were identified as desired specific objectives of the subject. Accordingly, at the conclusion of the course, learners should:

- have detailed understanding of the composition and application of their personal ethical framework
- have detailed knowledge of the concepts and principles regarding the ethical, legal, social and professional issues relevant to the development and delivery of multimedia and an ability to apply these concepts and principles in practice.
- be competent in making informed judgments about the impact of multimedia and information technology on the individual, organisation and society
- understand the 'current state of play' of the information economy in Australia and understand the strategic direction of state and federal governments with regard to the information economy and understand the role of Australia in the global information economy
- understand and engage in the discourse surrounding: Ethical codes for computing and information technology professionals; International domain name control and registration; Domain name registrar accreditation; Disability discrimination in online environments; Digital image manipulation; Content control; Online pornography/erotica; Privacy, security and encryption; Hacking and cybercrime/terrorism; Copyright and intellectual property law
- effectively incorporate ethical practice in the design, development and evaluation of multimedia solutions
- apply knowledge of the ethical, social and legal impact of the use of multimedia applications and technology to a business situation in the form of specific analysis and recommendation.

Resources: The resources developed exist primarily in an online format. Resources for in class workshops were developed in hard copy. Workshops in weeks 2,3 and 4 concentrated on exploration of personal ethical frameworks and utilised scenario analysis as a delivery strategy. Student seminar and discussion sessions were scheduled to take place in weeks 5 – 14.

Phase 2: Knowledge/content analysis. What do we want to achieve? (What is the terminal objective? What type/s of knowledge does the learner need to develop?) In this phase, subject content was analysed and evaluated in relation to the stated aims and objectives of the subject, and to ensure that a variety of learning approaches were appreciated. The teaching strategy adopted included lectures, workshops and online fora, integrating scenario analysis, and facilitating formal and informal discussion. As part of this process major learning goals and objectives were defined -"(i)…the terminal objective of instruction" (Taylor, 1994) and subject content was assembled from multiple sources and evaluated –"(ii)…analyse the underlying declarative

knowledge base of an expert (or experts)" (Taylor, 1994), and arranged into relatively broad topic areas. The broad topic areas comprise four main modules, providing multiple entry points for learners.

Entry points: Four primary organising factors were identified and implemented to provide overall structure to the subject content. These were: Module 1: Ethical considerations; Module 2: Social factors; Module 3: Legal framework; Module 4: Professional issues. Students are required to undertake all four modules of study. Initial modules are presented linearly to enable learners to progressively develop understanding of primary concepts and principles (Figure 2 — Detail 'Gov.au').

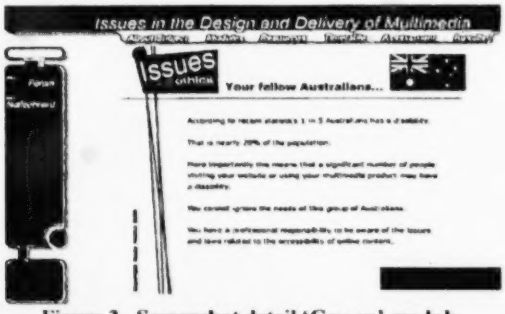

Figure 2. Screenshot detail 'Gov.au' module.

Exit points: Four assessment items were specified. They are: Participation in online fora; 20 minute seminar with oral defence; Academic paper - Article reflection; Consultancy report for 'real world' client.

As the subject is taught as part of an undergraduate program exit points are prescribed in that learners must undertake all assessment items. However, learners have control over a number of aspects of assessment. For example, at the commencement of the semester students submit suggested fora topics. Students then 'vote' for four preferred fora topics. When selecting seminar topics learners can select from a provided list or negotiate a topic of choice. Articles for reflection are supplied, however learners are also able to analyse (approved) articles of choice. Further, students are encouraged to self select a client partner for the consultancy report.

Knowledge: In order to achieve desired learning outcomes learners needed to develop (at least) two types of knowledge – explicit and implicit (Sternberg, 1998, p 13). For example, as primarily novice learners, the students require explicit knowledge " … knowledge of the facts, formulas, principles, and major ideas of a domain of inquiry." (Sternberg, 1998, p 13), in this case knowledge of ethical, social, legal and professional issues required to function as multimedia designers, they also required high levels of implicit knowledge –tacit knowledge of the domain (multimedia) and the social organisation (their classroom and the University) (Sternberg, 1998, p 13). According to Gagne et al, the locus of control in learning rests with the learner, in that the learner brings to the process of learning inherent cognitive strategies that facilitate understanding (Gagne, 1987, p66). This view is shared by Simonson and Thompson when they discuss cognitive theory and computer based instruction "CBI needs to be organised and delivered in a way that compliments the cognitive structure and level of sophistication of the learner "(1994, p36). Further, Gagne states that learner's process information according to the cognitive strategies used by the learner, and when new strategies are acquired metacognition takes place. That is the process of "learning to learn" is analysed and edited by the learner, increasing the level of understanding (Gagne, 1987, p66). Similarly, Bruner discusses the concepts central to cognitive theory as being: how knowledge is organised and structured; readiness for learning; intuition; motivation (in Simonson & Thompson, 1994, p37). Hypermedia is used as an example of a "powerful tool" in computer based instruction "that is non-linear and non-sequential … [and] used by cognitive scientists to examine how students interact with instruction during the process of learning" (Simonson and Thompson, 1994, p37).

Phase 3: Sequencing/synthesising content. How can we get there? (What are the major instructional strategies? What are the learning activities that will be used?) In early iterations of the subject, any opportunity for peer to peer discussion in any formal or semi formal educational environment was non-existent. The opportunity to provide students with content in a way that integrated their areas of professional interest

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(computer mediated communication, multimedia and the Internet), and directly related to content issues they were discussing (legal, social, professional and ethical issues in a networked multimedia environment) was identified. Students were encouraged to learn through understanding by articulating and defending their views through delivery of a student seminar with oral defence and to become proactive learners by setting their own research direction within the criteria for the major assessment item. In addition, tailoring delivery of resources in this way also provided opportunities to help learners identify and expand bridging points between subjects being studied simultaneously. For example, students are required to complete the subject 'Computer Mediated Communication' in the same semester as 'Issues in the Design and Delivery of Multimedia'. ' Computer Mediated Communication' requires students to examine and apply concepts and principles related to communication in 'virtual' environments while 'Issues in the Design and Delivery of Multimedia' provides such an environment through the online fora.

Instructional strategies: Instructional strategies were identified "strategy and role-playing games, intentional learning environment, case studies, coaching and scaffolding, learning by design, group, cooperative, collaborative learning" (Wilson, 1997). In practice teaching strategies focusing on the needs, preferences and expectations of the learner were implemented. These instructional strategies were modelled on the effective practice guidelines and qualities as articulated by Collins (1998) and Jonassen (2001) and comprised:

- striving to create a classroom atmosphere (both on campus and online) that is conducive to collaborative learning and is supportive and inclusive of all learners
- encouraging learners to form learning alliances with their peers in order to share information and knowledge within a peer supported learning framework
- promoting strategies that foster a sophisticated level of understanding of subject content and related concepts by encouraging learners to relate content to personal schema.

Early modules utilised short video segments to coach and support novice learners, and to 'personalise' the eLearning environment (Figure 3.). Students were given simple instructions and study direction for the module.

Figure 3. Screenshot showing video segment and transcript.

The rationale for using the online fora was based on two concepts. Firstly, high level understanding of the subject content and specifically complex ethical issues, comes not through transmissive teaching but from engagement with the discourse surrounding specific issues. Secondly, based on anecdotal evidence suggesting a high rate of usage of computer mediated communication technology among multimedia students it seemed that multimedia students would adapt quickly to the medium and engage readily with the concept of an online discussion environment. This view has been supported by the subsequent rapid development of the fora into a dynamic 'virtual' discussion environment where students feel comfortable in forming and expressing their opinions on issues related to the subject content. Evaluation feedback showed that 69% of respondents stated that they would have contributed to the fora even if it were not assessed.

A further area of innovation in this subject involved the use of a 20 minute seminar with oral defence to assess student understanding of specific concepts. As multimedia students are, in general, high achieving students the seminar was implemented as an assessment item to provide a high level of cognitive challenge and stimulation for second year students. This aspect reflected one of Jonassen's (eight) qualities of meaningful learning environments - namely the provision of a complexity (2001). Additional challenge was provided in the form of

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weekly reflection questions. The questions were designed to provide extension to in class discussion and activity.

Phase 4: Evaluation. How do we know we have achieved our aims? (What are the results of formative and summative evaluation?) Students were surveyed (informally) at the start of the semester "[to]… measure the extant knowledge bases of the relative novices…" (Taylor, 1994). The purpose of the survey was twofold. Firstly, it was important to discover existing levels of knowledge and expectation, and for students to begin to examine the validity of their assumptions and expectations. Students were asked to examine: what they knew now, what they hoped to know and what they thought the subject would help them learn.
Based on the outcome of the survey, the subject design focussed on taking the learners from where they were situated at the start of the subject (self identified novices) to where they expected to be (more or less) at the conclusion of the subject (multimedia producers cognisant of ethical and professional issues related to the field). This progression reflected Taylors "… gradual elaboration of a series of organisers…" (Taylor, 1994).

Conclusion

The use of a supported eLearning environment for the subject 'Issues in the Design and Delivery of Multimedia' provided students with a valuable learning resource. While students enjoyed ease of access, intellectual challenge and willingly contributed to the online fora, the majority of high level discussion and complex reasoning still took place within the on campus classroom.

Within distributed learning environments, multimedia and Internet technology provide a vehicle for the transmission of content material, in the same way print materials, and audio/video cassettes have traditionally done. Technical capabilities aside, it matters little whether content is delivered via CD-ROM, the Internet, audio or video cassette, or even print based materials, as these technologies merely provide the substrate to the learning resource. Unless the subject structure and content is based on sound pedagogical theory, and sits within a coherent, supported learning framework, it will make no difference whether cutting edge multimedia and Internet technology have been used. The content will make little sense to the learner.

References

Brookfield, S. 1995 The Getting of Wisdom: What Critically Reflective Teaching is and Why It's Important [Online], Available: http://mlu04.nl.edu/ace/Resources/Documents/Wisdom.html [11 July 2001].

Bruner, R. 1994 In Simonson & Thompson, ***Educational computing Foundations*** Merrill: New York

Collins, M. 1998 I Know My Instructional Technologies: It's These Learners That Perplex Me! [Online], Available: http://www.ties.k12.mn.us/stmarys/Collins.html [06 March 2001]

Colorito, R 2001 *Learning Online* Indiana Alumni Magazine Vol. 64, No. 1 -September/October

Gagne, R. 1987 ***Instructional Technology Foundations*** Lawrence Erlbaum Assoc: New Jersey

Jonassen, D. 2001 Design of Constructivist Learning Environments [Online], Available: http://www.coe.missouri.edu/~jonassen/courses/CLE/index.html [10 July 2001]

Maki, R., Maki, W., Patterson, M., & Whittaker, P. 2000 *Evaluation of a Web-based Introductory Psychology Course: I. Learning and Satisfaction in on-line versus Lecture Courses.* Behavior Research Methods, Instruments, & Computers pp. 32, 230-39

McInnis, C., James, R., Hanley, R. 2000 *Trends in the first Year Experience. In Australian Universities* Department of Education, Training and Youth Affairs. Commonwealth of Australia

Simonson, M.R. Thompson, A. 1994 ***Educational Computing Foundations*** Merrill: New York

Sternberg, R.J. 1998*"Abilities Are Forms of Developing Expertise"*, Educational Researcher, vol. 27, no. 3, April, pp. 11-20.

Taylor, J.C. 1994*"Novex Analysis: A Cognitive Science Approach to Instructional Design"*, Educational Technology, vol.xxxiv, no.5, May-June, pp. 5-13.

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